



**DC/DC CONVERTER**

**Single Output DC/DC Converter**

**Series M-78-NZ**  
Up to 7.5 Watt | DC-DC Converter



**FEATURES:**

- No heatsink required
- 3 Pin SIP package
- Non-isolated
- Low ripple and noise
- RoHS compliant
- Operating temperature -40°C to +85°C
- Very high efficiency up to 96%
- Pin compatible to multiple manufacturers
- Regulated outputs



**Models**

**Single output**

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	Efficiency Vin Max (%)	Efficiency Vin Min (%)
M-783.3-NZ	4.5-30	3.3	500	77	90
M-785.0-NZ	6.5-30	5	500	81	94
M-786.5-NZ	8-30	6.5	500	85	95
M-789.0-NZ	11-30	9	500	89	95
M-7812-NZ	15-30	12	500	92	96
M-7815-NZ	18-30	15	500	93	96

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

**Input Specifications**

Parameters	Conditions	Typical	Maximum	Units
Voltage range	See the table above			VDC
Filter	Capacitor			
Quiescent current	Vin=(LL-HL) at 0% load		13	mA
Short circuit consumption		1.8		W

**Output Specifications**

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	100% load	±3		%
Short circuit protection	Continuous			
Short circuit restart	Auto recovery			
Output current limit			2	A
Thermal shutdown	Internal IC junction	160		°C
Line voltage regulation	Vin=(LL-HL) at full load	±1		%
Load voltage regulation	10-100% load	±0.75		%
Temperature coefficient	-40°C to +85°C ambient	±0.02		%/°C
Ripple & Noise	20MHz Bandwidth	35		mV p-p
Max capacitive load			1000	uF

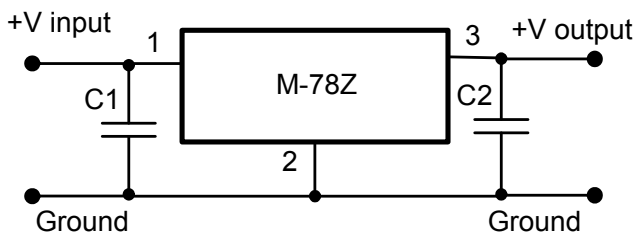
**General Specifications**

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	100% load	330		KHz
Operating temperature	With derating above 71 °C	-40 to +85		°C
Storage temperature		-55 to +125		°C
Maximum case temperature			100	°C
Cooling	Free air convection			
Humidity			95	%
Case material	Non-conductive black plastic (UL94V-0 rated)			
Weight		2		g
Dimensions (L x W x H)		0.45 x 0.30 x 0.40 inches	11.50 x 7.55 x 10.20 mm	
MTBF		> 2 000 000 hrs (MIL-HDBK-217F, Ground Benign, t=+25°C)		
Soldering temperature	1.5 mm from case for 10 sec		300	°C

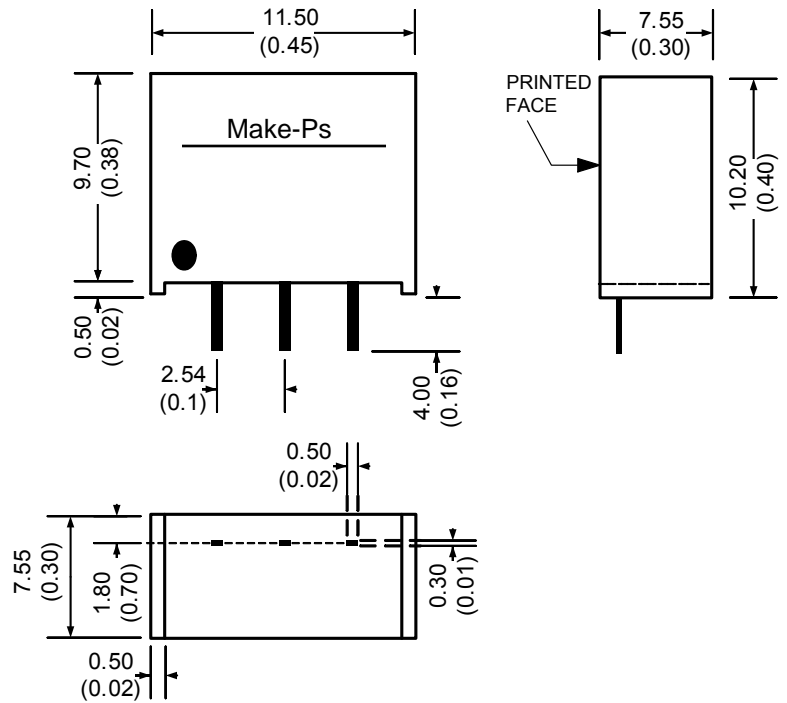
### Pin Out Specifications

Pin	Positive Output	Negative Output
1	+V Input	+V Input
2	Ground	-V Output
3	+V Output	Ground

### Standard Application Circuit



### Dimensions

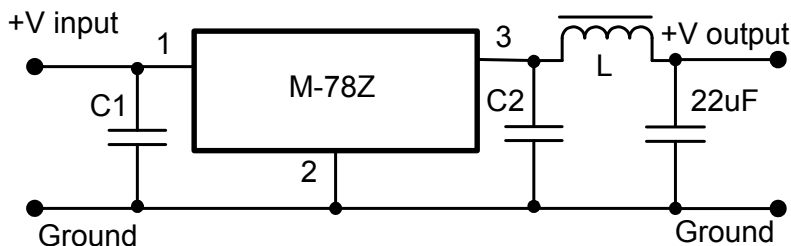


Dimensions are in mm (inch)  
 Pin Tolerance:  $\pm 0.16$ mm(0.004 inch)  
 Case Tolerance:  $\pm 0.25$  mm(0.01 inch)

### External Capacitor values

Model Number	C1, C3 (ceramic capacitor)	C2, C4 (ceramic capacitor)
M-783.3-NZ	10uF/50V	22uF/16V
M-785.0-NZ	10uF/50V	22uF/16V
M-786.5-NZ	10uF/50V	10uF/16V
M-789.0NZ	10uF/50V	10uF/16V
M-7812-NZ	10uF/50V	10uF/25V
M-7815-NZ	10uF/50V	10uF/25V

### Ripple and Noise Reduction



Recommended value of inductor L is between 10uH to 47uH

Derating

